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ScienceDirect

Procedia Social and Behavioral Sciences 5 (2010) 1868–1873

Procedia
Social and Behavioral Sciences

WCPCG-2010

Effectiveness of Information-Motivation and Behavioral skill (IMB) model in improving self-care behaviors & Hba1c measure in adults with type2 diabetes in Iran-Tabriz

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Received January 4, 2010; revised February 21, 2010; accepted March 9, 2010

Abstract

The current study assessed the effectiveness of Information-Motivation and Behavioral skill (IMB) model as a short-term, low-cost and comprehensive behavior change framework, in improving self-care behaviors in a sample of 30 adult patients with type 2 diabetes in Iran, Tabriz.

Findings revealed that, the total self-care, and the self-care of diet and exercise has been increased significantly in the experimental group .Behavior change was qualified by significantly decreased HbA1C in the experimental group, and the weight loss either was not significant, the high effect size in the experimental group revealed the impact of intervention on decreasing the weight. The self-care of glucose control (self monitoring), and foot care, also were more than the control group but the differences were not statistically significant.

The researcher, thus, concluded that information-motivation and behavioural skill (IMB) model can be an appropriate method for improving the self- care behaviors in patients suffering from type 2 diabetes.

Keywords: information-motivation and behavioural skill (IMB) model, Diabetes, self-care, behaviour change, HbA1C

1. Introduction

Diabetes is a chronic illness that requires continuing medical care and patient self-management education to reduce the risk of long-term and acute complications (American Diabetes Association, 2009). More than 171 million people have diabetes in the world and this number is expected to reach up to 366 million in 2030 (Wild, Roglic, Green, Sicree& King, 2004). Iran has a 7.7% (approximately 2 million adults) population rate of prevalence of diabetes within the age range, from 25 to 64 (Esteghamati et al, 2008). This rather high prevalence is seemingly rising (Rathmann& Giani, 2004). Diabetes is also associated with significant health care costs (National diabetes

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1877-0428
doi:10.1016/j.sbspro.2010.07.380

fact sheet, 2007) .The aggregate annual direct costs of diabetes in Iran, is estimated to be 590.676±65.985 million US dollars (Esteghamati et al., 2009). As prevalence of diabetes in elderly people has increased and their life expectancy has shortened (Boyle et al., 2001), it seems important to understand those factors that affect their outcome.

Basically the remedy of diabetes, in a large extent, depends on patients' self-care. Patients are expected to control 95 % of diabetes themselves, and make a significant change in their life style. They should change simultaneously their diet, physical exercise, and individual control of their blood sugar (Clarke, 2002). However recent studies, using national representative samples have shown that few patients follow multiple self-care behaviors at recommended levels (Nwasuruba, Khan& Egede, 2007; Nwasuruba, Osuagwu, Bae, Singh& Egede, 2009).

There are several self-care interventions currently being implemented with diabetic patients, but most of them are atheoretical and focus primarily on disseminating information, not on increasing motivation and providing behavioral skills training, also **some** educations have not consistently resulted in improved glycemic control (Brown, 1992; Glasgow & Osteen, 1992). Leaders in diabetes education emphasize the importance of using health behaviors change theories and models to drive diabetes self-care efforts, because they are more likely to effectively change behavior and maintain behavior change (Osborn & Fisher, 2008). It is thus critically important to develop theory-based interventions that have empirically demonstrated effectiveness in increasing behavior changes.

The information-motivation-behavioral skills model (IMB model) (Fisher & Fisher, 1992; Fisher & Fisher, 2000), is one of recently developed models that provide a framework for a brief health promotion counseling (Osborn, 2006).Intervention based on this model has been effective in influencing behavioral changes over a variety of clinical applications (Osborn& egede,2009; Anderson et al., 2006; Kalichman et al., 2002). The IMB model holds that information is a prerequisite for changing behavior, but in itself is insufficient to achieve this change (Mazzuca, 1982). According to The IMB model improved glycemic control, is function of; individuals information about diabetes self-care behaviors, motivation to engage in self-care implementation & behavioral skills for performing the specific acts involved in self-care activities.

2. Methods

2.1. Samples

From a list of the referred people to a gland specializing clinic between May and July, 68 people having type tow diabetes were initially selected. From these people 32 were eventually selected according to a specific criteria and their inclination, to take part in the study and were divided into two control and intervention groups. Since two people from the control group later refused to participate, the sample number was reduced to 30 people (16 in the intervention and 14 in the control group).

The eligible participants had to have: a minimum of 6 months being passed from their diabetes diagnosis, having Hba1c>7 and being literate. Patients were excluded under these conditions: having medical problems other than diabetes, having certain needs to medication increase, being mentally retarded, having mental problems or having psychotherapy besides the present study.

2.1.1. Data & procedure

All participants were visited by a doctor and after fulfilling the specific criteria they answered the SDSC questionnaire. Also their weight and Hba1c were measured.

The Intervention group in two groups of eight received their Intervention in two 30 and 100 minute sessions in different days at the hospital. In this period no especial intervention, except regular medical intervention, was done to the control group. 18 days after the last IMB intervention session, the intervention group had a follow up session that was considered as reinforcement session, and their exercise, diet and stress evaluation sheets were studied. Then 2 months after the pre-test, the second indices measurement was done and all participants were asked to answer the second diabetes self-care questionnaire (SDSC), and the weight and Hba1c of both groups were measured.

2.2. Measures

2.2.1. (SDSCA) scale

Self-care behaviors were assessed with the validated 11-item Summary of Diabetes Self-Care Activities (SDSCA) scale (Toobert, Hampson & Glasgow, 2000). The SDSCA measures frequency of self-care activity in the last 7 days for aspects of the diabetes regimen: diet, exercise, blood glucose testing, foot care and cigarette smoking.

2.2.1.1. Glycemic control

A blood test was used to obtain Hemoglobin A1C. HbA1c is a measure of long-term diabetes control that indicates glycemic control over the previous 2-3 months (**Larsen, Horder& Mogensen, 1990).** HbA1C has strong predictive value for diabetes complications (Stratton, Adler, Neil, Matthews, Holman, 2000) and higher A1C indicates worse glycemic control (Goldstein et al., 1995).

2.3. Statistical analyses

Pretest equivalence of the Intervention and Control group on total self care (F= 0.132, P=0.719); Weight (F=0.002, p=0.962) and HbA1C (F=1.662, P=0.208) level, that was examined by T-Test, were not significant (p>0.05). Univariate analysis of covariance (ANCOVA) examined the effect of intervention on the health outcomes with pretest scores as the covariate. The hypothesis estimating the effect of the IMB model on the self-care subscales indexes, were assessed by MANCOVA. While studying the hypothesis, the η (partial eta- squared) value was also measured. The η value is the amount of variance in the distributions that shows the practical significance (Cohen, 1988).

3. Results

3.1. Sample characteristics

Participants were on average 57 years old, the majority were female (63.3%) and most of them (70%) had school & junior high school education. Table1 compares the demographic characteristics of the participants in the intervention and control group. The mean and standard deviation of each dependent variable was calculated for each group at pre & post test (table2).

Table1. Sample demographics

	intervention(g)	control(g)
characteristics	n (%) or M±SD	n (%) or M±SD
Male	5(31.2)	6(42.9)
Female	11(68.8)	8(57.1)
Age	56.062±12.646	58.285±7.456
Education		
<high school graduate	10(62.5)	11(78.6)
high school graduate	5(31.2)	2(14.3)
>high school graduate	1(6.2)	1(7.1)

3.1.1. Effects of the intervention on health behaviors

As presented in table 2, controlling the pre-test effect leads to a significant difference in mean of two studied groups regarding self-care behaviours and HbA1C levels (p<0.05) but there was no significant difference regarding weight loss (p>0.05).

Table 2. Pre& Post-test means and standard deviations of dependent variables in 2 groups, and the test of group differences at post-tests

Parameter	Group	Pre-test		Post-test		F	P	η
		M	SD	M	SD			
DSC	intervention	24.125	9.50	39.187	10.508	25.326	0.001	0.484
	Control	23.428	10.675	25.462	9.443			
weight	intervention	72.687	9.40	72.125	9.387	4.147	0.052	0.138
	Control	73	10.295	73.230	10.489			
Hba1c	intervention	8.923	1.142	7.775	0.819	10.530	0.002	0.281
	control	8.407	0.790	8.30	0.792			

3.1.1.1. Effects of the intervention in the SDSCA subscales

The assumption of homogeneity of covariance matrices was satisfied, box's M test = 18.359, F= 1.547, P= 0.116. The MANCOVA model was significant for the group main effect, the Pillai's trace F= 7.599 was significant, P= 0.001. The η value was 0.591, which is indicative of the strong effect size.

As it is shown in Table3, IMB intervention causes significant difference after diet and Exercise self-care pre-test ($p<0.05$). This table also indicates that IMB intervention also leads to an insignificant difference in the self-care of glucose control (self monitoring) and foot care posttest ($p>0.05$).

Table 3. Mean (±SD) scores on the SDSC questionnaire subscales, & test of group differences at post-test

Measure	Intervention(g) m±SD	Control(g) m±SD	F	P	η
Diet	22.437±5.085	14.21±4.964	16.563	0.001	0.408
Exercise	7.625±3.117	5±4.574	9.030	0.006	0.273
Self monitoring	0.437±0.727	0.214±0.425	1.266	0.272	0.050
Foot care	8.687±5.629	6.214±5.308	2.488	0.128	0.094

4. Discussion

The findings of recent study suggest that IMB model had effect on self-care behaviors and through the behavior on glycemic control. These findings are in accordance with Osborn & Egede (2009).

One of the concerns that should be born in mind in treating diabetic patients is their weight loss. Short-term studies have demonstrated that moderate weight loss (5%of body weight) in patients with type2 diabetes, is associated with decreased insulin resistance, improved measure of glycemia, & lipemia & reduced blood pressure (Klein et al, 2004). As findings of this research suggest, experiment group people showed more weight loss compared to the control group, which in accordance with Norris, Engelgau & Narayan (2001), follow up session, considered as reinforcement could play a role.

Like previous studies (Osborn, 2006; Osborn& Egede, 2009), IMB model in self-care subscales, had meaningful effect on diet and exercise. Although the differences of self monitoring and foot care, were not statistically significant, the effect size, related to IMB intervention's effect on them, were 0.05 & 0.094, which is suggestive of practical significance in experimental group, whose results were consistent with Osborn (2009) findings.

In keeping with IMB model, people having more information, personal& social motivations, show better self-care behaviors (Osborn & Egede, 2009), it seems that increasing motivation excels self-care behaviors in experimental group. Also as people who have behavioral skills, have confidence in their ability to do across various situations (Fisher& Fisher, 2000; Fisher, Fisher& Harman, 2003), behavioral skills can be considered as increasing factors of diabetes self care.

Limitations of this study are as following: 1. the sample size was small which limited statistical power and precision. 2. Because we investigated an inner city population, generalization of this finding should be made with caution. The strength of this study includes medication effect control and using theoretical, short-term, cost effective generable model that was used to inform the intervention design.

5. Conclusion

In chronic diseases such as diabetes, patients usually get disappointed and develop beliefs that they are not able to change their behaviors, therefore increasing motivation and teaching behavioral skills according to their individual life styles, are extremely beneficial for these patients. IMB model can be an appropriate method for improving the self care behaviors in patients suffering from type 2 diabetes.

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